RIODICAL Calif. Univ. Publications in Zoology.
3(9+10)
LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS
3(9+1

UNIVERSITY OF CALIFORNIA PUBLICATIONS
ZOOLOGY
Vol. 3, Nos. 9, and 10, pp. 135-158, Pls. 18-20 January 29, 1907

CONTRIBUTIONS FROM THE LABORATORY
OF THE
MARINE BIOLOGICAL ASSOCIATION OF SAN DIEGO (XIV and XV)

XIV

OSTRACODA OF THE SAN DIEGO REGION

II. LITTORAL FORMS

BY

CHANCEY JUDAY

XV

CLADOCERA OF THE SAN DIEGO REGION

BY

CHANCEY JUDAY

BERKELEY
THE UNIVERSITY PRESS
PRICE $0.25

UNIVERSITY OF CALIFORNIA PUBLICATIONS

Note.—The University of California Publications are offered in exchange for the publications of learned societies and institutions, universities and libraries. Complete lists of all the publications of the University will be sent upon request. For sample copies, lists of publications or other information, address the **Manager of the University Press, Berkeley, California, U. S. A.** All matter sent in exchange should be addressed to **The Exchange Department, University Library, Berkeley, California, U. S. A.**

ZOOLOGY.—W. E. Ritter, Editor. Price per volume $3.50. Volumes I (pp. completed. Volume II completed. Volume III (in progress). Commencing with Volume II, this series contains Contributions from the Laboratory of the Marine Biological Association of San Diego.

No. 1. Some Observations on the Nervous System of Copepoda, by C. O. Esterly. Pages 12, Plates 2. . . . . Price, .25

No. 2. Ostracoda of the San Diego Region. I.—Halocypridae, by Chancey Juday. Pages 26, Plates 4. . . . . Price, .30

No. 3. The California Shore Anemone, *Bunodactis Xanthogrammica*, by Harry Beal Torrey. Pages 6, Plate 1.

No. 4. Sexual Dimorphism in Aglaophenia, by Harry Beal Torrey and Ann Martin. Pages 7, text-figures 9.

In one cover. Price .15

No. 5. Additions to the Copepod Fauna of the San Diego Region, by Calvin Olin Esterly. Pages 40, Plates 5. . . . Price, .35

No. 6. Dinoflagellata of the San Diego Region, II. On *Triposolenia*, a New Genus of the Dinophysidae, by Charles Atwood Kofoid. Pages 24, Plates 3.

No. 7. A Discussion of the Species Characters in Triposolenia, by Charles Atwood Kofoid. Pages 10.

No. 8. On the Significance of the Asymmetry in Triposolenia, by Charles Atwood Kofoid; Pages 7.

In one cover. Price .35

No. 9. Ostracoda of the San Diego Region. II.—Littoral Forms, by Chancey Juday. Pages 22, Pls. 3.

No. 10. Cladocera of the San Diego Region, by Chancey Juday. Pages 2, text-figure 1.

In one cover. Price .25

The following series in Graeco-Roman Archaeology, Egyptian Archaeology, American Archaeology and Ethnology and Anthropological Memoirs are publications from the Department of Anthropology:

GRAECO-ROMAN ARCHAEOLOGY. (Large Octavo).

Vol. 1. The Tebtunis Papyri, Part 1. Edited by Bernard P. Grenfell, Arthur S. Hunt, and J. Gilbart Smyly. Pages 690, Plates 9, 1902 . . . . . Price, $16.00

Vol. 2. The Tebtunis Papyri, Part 2 (in press).

Vol. 3. The Tebtunis Papyri, Part 3 (in preparation).

EGYPTIAN ARCHAEOLOGY. (Quarto).

Vol. 1. The Hearst Medical Papyrus. Edited by G. A. Reisner. Hieratic text in 17 facsimile plates in collotype, with introduction and vocabulary. pages 48, 1905. (J. C. Hinrichs, Leipzig, 25 Marks) . . . . . Price, $8.00

AMERICAN ARCHAEOLOGY AND ETHNOLOGY. (Octavo).

Vol. 2. No. 1. The Exploration of the Potter Creek Cave, by William J. Sinclair. Pages 27, Plates 14, April, 1904 . . Price, .40

No. 2. The Languages of the Coast of California South of San Francisco, by A. L. Kroeber. Pages 52, June, 1904. Price, .60

No. 3. Types of Indian Culture in California, by A. L. Kroeber. Pages 22, June, 1904. . . . . Price, .25

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

UNIVERSITY OF CALIFORNIA PUBLICATIONS
ZOOLOGY
Vol. 3, No. 9, pp. 135-156, Pls. 18-20 January 29, 1907

CONTRIBUTIONS FROM THE LABORATORY
OF THE
MARINE BIOLOGICAL ASSOCIATION OF SAN DIEGO.

XIV.

OSTRACODA OF THE SAN DIEGO REGION.

II. LITTORAL FORMS.

BY
CHAUNCEY JUDAY.

As stated in the paper on Halocypridae, very few of the thousand plankton catches examined were made in the shallower water, and of these only nine contained littoral forms of Ostracoda. The various forms represented in this small number of catches belong to the two groups Podocopa and Myodocopa.

PODOCOPA Sars, 1865.

Shell never with antennal sinus. The inner branch of the antenna more strongly developed than the outer; the former three- or four-jointed, the latter sometimes two-jointed, but usually without joints. Maxilla always with a respiratory appendage; furca either rudimentary, or when developed, consisting of slender, elongated laminae which bear few terminal spines.

Family CYTHERIDAE Baird, 1850.

Shell extremely variable in form, usually strongly calcareous and firm; often with a complex sculpture. Antennule with five to seven joints, second and third always fused. Antenna without natatory setae; fourth joint of inner branch usually with three claws or setae. Mandible three- or four-jointed; exopodite usually developed as a respiratory plate. Three pairs of walking

legs. In the male a peculiar brush-like organ is found between or in front of the first pair of legs; this organ is never present in the female. Furca always small and weak, usually with two setae.

Genus **Xestoleberis** Sars, 1865.

Shell smooth, left valve somewhat larger than right so that its anterior, ventral, and posterior margins overlap the right valve when closed; a tooth at the anterior end of the hinge and one at the posterior end.

Antennule six-jointed, only moderately elongated; armed with regular setae. Antenna four-jointed (3 and 4 fused); last joint armed with two strong claws. Basal joint of mandible short; mandibular palp short, three-jointed (1 and 2 fused); with a distinct respiratory plate which bears two respiratory setae The respiratory plate of the maxilla bears a long aberrant seta which is not plumose. The three pairs of legs moderately elongated; anterior and posterior margins of the first joint of the legs with at least one seta in addition to the claw-like setae at the distal ends of these joints. In the female the furca always bears two setae, of which the upper is the longer than the lower; in the male the furca is more or less closely united with the penis, and sometimes bears three setae. The penis is always distinctly separated into a basal portion and a movable head portion.

Xestoleberis dispar Müller.

Pl. 18, figs. 1, 2.

1894. *Xestoleberis dispar*, Müller, G. W., p. 334, pl. XXV, figs. 2, 3, 9, 35.

Height of shell of female more than half the length, about 1:1.7; highest just behind the middle; dorsal margin broadly and regularly arched; posterior margin boldly arched, the boldest portion of the arch lying just above the middle; ventral margin curving in somewhat anteriorly, making a rather bold arch at the antero-ventral corner; anterior margin regularly curved. Width about equal to greatest height, sometimes a little greater than height.

Shell of male in side view nearly oval in outline; scarcely twice as long as high; dorsal margin regularly arched, ventral

not so strongly arched; anterior and posterior margins curving over regularly into dorsal and ventral. Shell of most males and females transparent; some with a brown color in the region of the attachment of the valve muscles, others with almost the entire shell tinged with brown.

Length of female 0.57; male 0.5 mm.

Catch 531, San Pedro, June 20, 1901.

Genus **Paracytheroma** nov. gen.

Shell in both male and female smooth, transparent, very thin and weak; with a small clasping process at the anterior and posterior ends of hinge. Antennule short and strong, six-jointed; the last four joints sometimes bent upward forming a knee with the second joint; the third, fourth, and fifth joints bear claw-like setae; sixth joint long and slender, about five times as long as wide; bearing three setae, one of which is claw-like, one elongated and whip-like, while the third is a club-shaped sensory seta. Antenna rather short and strong, four-jointed; last joint with two long claws. Masticating portion of mandible large and strong, armed with a number of teeth; mandibular palp four-jointed, the respiratory plate of the first joint bears two long setae. Maxilla of typical structure, with a long aberrant seta. First leg rather short, third much elongated; the first joint of the first and second legs with two setae near the middle of the anterior margin and one on the posterior margin; on the first leg this joint has two claws at the distal end, and on the second leg only one; first joint of third leg with a minute spinule near the middle of the anterior margin, a seta on the posterior margin, and a single claw at the distal end.

In the female the furca is represented by two small lobes, one arising on either side of the posterior portion of the body a short distance in front of the posterior margin; between the lobes are two bifurcated setae which arise from the body wall near the bases of the lobes. In the male the furcal-lobes are small, and are closely united to the penis; three small setae arise at the lower margin of the lobes. The penis is distinctly separated into a large basal portion and a triangular head portion.

Paracytheroma pedrensis nov. sp.

Pl. 18, figs. 3-12.

Shell of both male and female, in side view, nearly oval in outline, highest toward the posterior end; nearly twice as long as greatest height; shell thin, delicate, transparent; the ventral margin curves in somewhat in its anterior half; the dorsal margin regularly curved, the arch being boldest posteriorly; anterior and posterior margins regularly arched, passing over gradually into the dorsal and ventral margins, posterior arch bolder than anterior; seen from above, bluntly wedge-shaped, widest posteriorly; strongly compressed, greatest width equal to about two-thirds the greatest height. The inner line of the shell originates near the anterior end of the hinge, curves forward and downward forming a broad, blunt arch; the ventral portion of the line runs almost parallel to the external margin of the shell; posteriorly it forms another regular arch which is not so blunt as the anterior one; dorsally the line ends near the posterior end of the hinge.

Length of both male and female 0.57; greatest height 0.3 mm.

Several individuals were found in a plankton catch which was made in the vicinity of San Pedro, California, on July 20, 1901.

Myodocopa Sars, 1865.

Shell usually with an antennal sinus. Basal joint of antenna large, pyriform, bearing two branches; primary branch natatory, with one, rarely three elongated joints, beyond which are at least six short joints which bear setae; secondary branch small, usually larger in male than in female and formed for grasping. Mandibular palp and first maxilla without branchial appendage. Furca broad, flattened, bearing at least three strong claws or spines.

Family CYPRIDINIDAE Baird, 1850.

Shell calcareous, strong, usually with a distinct rostrum and antennal sinus. Antennule with five to eight joints; fifth joint always with a sensory organ in the male, frequently in female. Principal branch of antenna usually nine-jointed; secondary

branch usually developed as a grasping organ in the male, sometimes rudimentary in both sexes. Mandibular palp usually four-jointed and very strong, last joint bearing claws. The seventh pair of appendages originates high up on the sides of the body; these limbs are long, many jointed, and worm-like. Furca always strong and armed with several spines.

Genus **Philomedes** Lilljeborg, 1853.

Mature female.—Shell always with a distinct rostral sinus overhung by a broad, blunt rostral process; postero-ventral angle often produced into a more or less distinct projection. Eyes small or wanting. Frontal organ long and slender. Antennule six-jointed, with rather long, sparsely plumose setae; no sensory seta. Antenna with a small secondary branch. Basal joint of mandible with a masticating process which is cleft at the apex; first joint of palp with some masticating spines at the base. First maxilla rather large and strong; second maxilla with two rather large teeth at the anterior corner, the inner tooth being smaller than the outer and bifid. First pair of legs more or less distinctly jointed; outer extremity separated into lobes.

Mature male.—Shell more elongated. The fifth (fourth) joint of the antennule with a sensory seta which bears a number of long sensory filaments; last joint with two very long setae which are usually reflexed upon the limb. Secondary branch of antenna three-jointed, prehensile, the last joint reflexed upon the second. Mandible without masticating processes. First maxilla only indistinctly joined, small, weak, armed with delicate setae. Second maxilla without teeth. Eyes well developed.

Philomedes longiseta nov. sp.

Pl. 18, figs. 13-15.

The shell of the male, in side view, is oval in outline, all the corners being rather evenly and regularly rounded; dorsal margin broadly and regularly arched, ventral moderately arched; posterior margin curving off gradually into both dorsal and ventral margins, forming a bolder regular arch. The rostral process

is short, broad, and truncated anteriorly; rostral sinus shallow, widely open forwards and downwards. The surface of the valves is everywhere pitted with round, oval, or quadrangular foveolae which vary somewhat in size; marginal hairs located chiefly along anterior and posterior margins. Transparent margin of shell rather broad and thickly fringed with cilia.

The first joint of the antennule bears no setae; second joint longer than first, about as long as the rest of the limb, bearing three setae toward the distal end which are plumose in the middle; this joint also has some very minute marginal spines; third joint sub-triangular, with two naked setae on the inner margin and one on the outer; fourth with two distal setae on the inner margin and four on the outer, two of the latter setae being naked and the other four more or less plumose in the middle; the fourth joint also possesses a rather large sensory seta on its outer margin which bears a tuft of hair-like processes on its basal fourth and divides into four small branches at its outer extremity; fifth joint with only a naked seta on its inner margin; sixth with two very long setae which are reflexed upon the limb and which bear a few hair-like processes; in addition, the sixth bears five much shorter setae, two of which are rather stout, possess some hair-like processes in the middle, and branch at the outer end; the other three are slender, unarmed, and not branched at the extremity.

The second joint of the swimming branch of the antenna bears a long naked seta at its distal end which reaches as far as the sixth or seventh joint; third joint longer than second and bearing a plumose swimming seta at its distal end; the remaining joints are short and bear ten plumose swimming setae. The first joint of the secondary branch of the antenna is a little longer than wide and bears a cluster of five small setae on its proximal end, just beyond these is a longer seta which is plumose in the middle; second joint long and slender, with two, sometimes three, annulated setae; third joint about three-fourths as long as the second and reflexed upon it; this joint consists of a rather large cone-shaped base and a slenderer, curved portion; the outer end has a few crenulations and bears two, sometimes three, small setae; the basal portion of the third joint bears a very long, peculiar seta; the proximal half of this seta is large and has thin walls similar

to those of the joints; this tapers down to a small annulated portion.

The mandible is without a masticating process. The vermiform limb bears very few setae, usually four terminal and four lateral. The caudal lamina has eleven claws, four of which are long and more or less pectinate at the base; the two terminal claws are longest and strongest, above them is a small claw, then a long one, followed by another short one which is, in turn, followed by another long one; the five upper ones are small.

Length 1.9; height 1.0 mm.

Catch 124, 6 miles off whistling buoy, San Diego, June 24, 1904, surface.

Catch 221, 6 miles off Point Loma, July 23, 1904, surface tow at night.

Philomedes lomae nov. sp.

Pl. 19, figs. 1-6.

Male.—Shell rather strongly calcareous and firm; greatest height a little behind the middle; dorsal margin more strongly arched than the ventral; at the postero-dorsal angle a blunt process arises a short distance in front of the margin of each valve and extends backward beyond the margin, thus forming a projection at this angle; a large blunt projection at the postero-ventral angle; rostral process broad and blunt; antennal sinus distinct but broad and shallow; sinus narrower and more pronounced in young specimens; a small rib-like ridge posteriorly a short distance above the ventral margin and another just below the dorsal margin. Shell densely pitted with small foveolae; transparent margin of moderate width and densely ciliated.

Third joint of antennule sub-triangular, closely jointed to the fourth; the outer extremity of the fourth bears a sensory appendage which has a tuft of cilia a short distance beyond the base; the two elongated setae borne by the last joint are about one and a half times as long as the entire limb. Frontal organ long and slender, two-jointed; first joint enlarged at the base, second forming a long, slender capitulum.

Antenna.—First joint of swimming branch elongated, cylindrical; second short, bearing a medium sized, non-plumose seta

at its outer end; third joint about as long as first, armed with a plumose seta at its outer extremity; the following six joints small, and quadrangular, each with a large plumose seta, except the last which also bears a small plumose seta in addition to the large one. The secondary branch consists of three joints; first joint rather short, quadrangular, with four small setae at the base and one near the middle; second and third joints elongated, slender, forming a grasping organ; the second bears two setae near the middle; third reflexed upon second, with one seta near its base and two near its outer extremity.

Basal joint of mandible without biting process and setae; first joint of palp with three setae on the upper margin and four on the lower; on the inner side at the distal end, this joint bears a sensory appendage which is ciliated at its outer end; second joint of palp short, with two setae on its lower margin; third elongated, cylindrical, with three setae on the upper margin and a tuft of four short and two longer setae at the distal end of the lower margin; last joint small, bearing a stout claw and three setae; none of the mandibular setae plumose.

Vermiform limb with four terminal and four lateral setae. The caudal lamina bears six claws, the upper two of which are very small; terminal claw strongly pectinated; remaining claws with very minute pectinations; each claw with a few cilia at the base.

Length 1.3; height 0.8 mm.

Female unknown.

Catches 124, 571, 589, 612. For these localities see *P. longiseta, Cylindroleberis mariae* and *Rutiderma rostrata.*

Genus **Cylindroleberis** Brady, 1868.

(*Asterope* Philippi.)

Shell more or less oblong or elliptical, smooth; in male rather larger than in female; always with a distinct rostral sinus. Eyes well developed in both sexes. Frontal organ long and slender. Antennule six- or seven-jointed; dorsal margin with numerous plumose setae; in both sexes the fifth joint bears a sensory organ; in the female the last joint bears only rather short setae, while in the male two are unusually long, about as long as the entire

animal. Natatory branch of the antenna well developed; secondary branch small in the female, sometimes jointed, sometimes not; in male three-jointed, the third joint reflexed upon the second forming a grasping organ. Mandible strongly built; basal joint with a large, falcate, reflexed masticating process which is serrated on the edge at the tip; second joint with a backward directed lobe at the base which is armed with a few peculiar spines. First maxilla without masticating process, in its stead a group of long plumose setae; main portion of limb falcate, with many long, stiff setae on the inner margin; in front a naked lamella arises from the main limb. The second maxilla consists of a tongue-like plate which is setose on its inner margin, and a large semicircular lamina which bears many long plumose setae on its margin. The first pair of legs arises directly behind the mouth; not jointed and without lobes; bearing some plumose setae on the ventral margin. The vermiform limb has a double row of teeth at its extremity. Furca broader than long, bearing several claws. There are seven pairs of rather large dorsal branchiae.

Cylindroleberis mariae Baird.

Pl. 19, figs. 7-11.

1850. *Cypridina mariae,* Baird, p. 257, pl. XVII, figs. 5-7.
1887. *Asterope oblonga* Sars, p. 31, pl. I, figs. 5-8; pl. II, figs. 1, 2; pls. V and VI.
1894. *Cylindroleberis oblonga* Müller, G. W., p. 219, pl. IV, figs. 14-18, 39, 41, 49-55; pl. V, figs. 1, 4, 5, 13, 14, 33, 41-44; pl. VIII, fig. 4.
1896. *Asterope mariae* Brady and Norman, p. 630, pl. L ,figs. 1-6; pl. LI, figs. 11-22; pl. LII, figs. 10-15.

Male.—Shell higher in front than behind; dorsal margin more or less arcuate throughout its entire extent; middle portion of ventral margin straight; posterior margin more or less truncate, curving over gradually into dorsal and ventral margins; rostrum large and distinct; a rather large antennal sinus situated a little below the middle of the anterior margin, directed downward and forward.

Frontal organ moderately long, bent upward at the base, and slightly dilated in the middle. Antennule six-jointed; fourth joint with a sensory organ at the distal end of the lower margin;

the sensory organ consists of a stout annulated base which bears numerous fine thread-like processes; the sixth joint bears three short and two very long setae. Antenna with the second joint of the natatory branch about as long as three of the following joints; secondary branch of antenna three-jointed, rather large and strong; first joint uniform in width, about four times as long as wide; second about as long as first, dilated on the side against which the last joint impinges, and bearing three setae just beyond the middle; third joint falcate, slender, about three-fourths as long as second, and reflexed upon it, forming a grasping organ; with a few serrations on its inner margin at the extremity and a seta near the proximal end.

The first maxilla consists of a lobe-like body portion and two acuminate arms; the smaller arm is straight and bears no setae; the outer portion of the other arm is bent around toward the body, forming a bow; the outer margin of the bow bears only two small setae and there are two at the extremity of the arm; the inner margin, except a small portion at the extremity, is densely fringed with long, slender setae. The vermiform limb bears six setae at its extremity and six on the sides. The furca bears ten claws; the upper five small, the lower five increasing in length and pectinated as well as ciliated.

Length 1.4; height 0.75 mm.

Female.—Shell in side view nearly oblong, dorsal and ventral margins scarcely arched in the middle, nearly straight; these margins curve over gradually into the anterior and the posterior. Antennal sinus narrow and deep, situated below middle of anterior margin. In both sexes the valves are strongly calcareous, smooth, and bear a few cilia along the anterior margin.

The sensory organ of the fourth joint of the antennule consists of an annulated basal portion which flattens out and divides into six thong-like processes; the sixth joint bears five setae which are about equal in length. Second joint of natatory branch of antenna scarcely as long as the two following joints; secondary branch of antenna three-jointed, the last joint being indistinctly separated from the second; the last joint bears a rather long seta. The arm-like projection of the second maxilla is twisted half way round in the female, but not twisted in the male.

Length 1.45; height 0.8 mm.

Distribution.—Adriatic (Grube); Spezzia, Messina, Goletta, Syracuse, coast of Norway (Sars); Bay of Biscay (Marquis de Folin); coast of England and Ireland, and Sicily Islands (Brady, Norman, and Robertson); Gulf of Naples (G. W. Müller); coast of southern California, catch 571, Ballast Pt., San Diego Bay, July 26, 1901, surface; catch 589, San Pedro, August 1, 1902; catch 644, San Diego Bay, July 7, 1903.

Genus **Pleoschisma** Brady. 1890.

Shell dense, surface smooth, pitted, or tuberculated; antennal sinus more or less distinct. Eyes rather small. Antennules in both sexes similar to those of *Philomedes*. In the male the secondary branch of the antenna is three-jointed, the third reflexed upon the second forming a grasping organ; in the female this branch is simple, one-jointed. Mandible with four or five joints; in the female the first joint bears a bifid masticating process, male without masticating process. The first maxilla consists of a two-jointed principal lobe and four smaller lobes, all bear setae; attached to the lobes is a large respiratory plate bearing plumose setae on its margin. Vermiform limb with a single claw-like process at its apex. Furca short and broad; armed with both setae and claws.

Pleoschisma oblonga nov. sp.

Pl. 19, fig. 12; pl. 20, figs. 1-7.

Shell of male in side view, oblong-ovate, truncate behind; about one and a half times as long as high; ventral margin broadly arched, passing over gradually into the anterior and posterior margins; dorsal margin rather strongly arched anteriorly but rounding off regularly into the posterior margin; rostrum broad, antennal sinus distinct but shallow and wide; a few short setae along margins of valves; transparent margin rather wide and densely ciliated. The surface of the shell is reticulated; these reticulations vary in size and shape, anteriorly they are arranged in rows and present the appearance of overlapping scales; in some instances, the individual areas composing the rows are not dis-

tinctly separated by cross lines; posteriorly the areas are distinctly circumscribed and are not arranged in rows.

The antennule of the male is very similar in size and armature to that of Philomedes; a sensory seta is borne by the antepenultimate joint; the basal third of this seta is enlarged and bears long, setiferous processes only on the outer side. The frontal organ is small, two-jointed; second joint enlarged, forming a capitulum. The first and third joints of the natatory branch of the antenna are elongated and together they compose about two-thirds of the length of the limb; the first joint bears no setae; second joint with a seta which is armed with short, stout spinules on its outer margin; each of the following six joints bears a long, plumose seta; the last joint bears six setae, two of which are small, the smallest possessing no plumules. The secondary branch of the antenna is prehensile, composed of three joints; first joint sub-quadrangular, with five small simple setae at the proximal end and a long seta, bearing a few plumules in the middle, at the outer end; second long and slender, with two setae on the inner margin; third nearly as long as the second and reflexed upon it, with two minute setae near the outer extremity; distal end with a few crenulations.

The basal joint of the mandible is without masticating process and setae; the first joint of the mandibular palp bears seven small simple setae and two larger plumose ones on the lower margin, and three simple ones on the upper margin; at the distal end of the upper margin is a process which bears two setae; second joint of palp much smaller than first, with four setae on the lower margin, one of which is plumose; third elongated, cylindrical, bearing seven setae on the upper margin and five on the lower; the three distal setae on the lower margin differ from the others, two of them possess a comb of minute spines on one side and have three prongs at the end, while the smallest bears some minute prongs near the end; last joint small, with three claws and three setae.

The first maxilla consists of a long two-jointed principal lobe which has a number of setae at its end, and four small lobes which also bear numerous setae; none of the setae denticulated, but some are rather stiff and claw-like, and a few are plumose.

Second and third maxillae very similar to those of Philomedes. Vermiform limb with one lateral and four terminal setae. The furca is short and sub-triangular; the marginal appendages consist of stout, spinous, pectinated claws and weak, seta-like structures; the upper two are small claws, the next three are setae, following these is a stout claw, then two more setae, another stout claw, and lastly, the large terminal claw.

Length 1.2; height 0.75 mm.

Female unknown.

Two males, catch 571, Ballast Pt., San Diego Bay, July 26, 1901; two males, catch 589, San Pedro, August 1, 1902.

Family RUTIDERMATIDAE Brady & Norman, 1896.

Antennule of female without sensory organ; antenna without secondary branch. Mandibular palp with last joint very large, terminating in a strongly developed chela.

Genus **Rutiderma** Brady & Norman, 1896.

Shell oval, truncate behind; antennal sinus variously developed, sometimes a mere notch, with no overhanging rostral process, sometimes rather large, and deep, with a distinct rostrum. Outer tooth of second maxilla three-lobed, lobes plain-edged. Furca with few ungues.

Rutiderma rostrata nov. sp.

Pl. 20, figs. 8-13.

Shell of female in side view nearly oval, rather distinctly truncated behind and somewhat higher than in front; ventral margin evenly arched; dorsal margin more boldly arched posteriorly; posterior margin slightly protuberant near the postero-ventral angle; rostrum distinct, with an overhanging beak; antennal sinus rather large and deep, opening downwards. The margins of the valves bear cilia which are longest anteriorly. A narrow, transparent marginal membrane extends from the postero-ventral protuberance forward along the ventral margin, thence along the anterior and dorsal margins to the anterior edge of the hinge; this marginal membrane is fringed with minute

cilia. The valves are densely pitted with foveolae which vary somewhat in size and shape. There are no riblets.

The frontal organ consists of a short basal portion and a long outer portion which is slender, with the exception of an enlargement near the middle. The antennule is five-jointed: first joint longest, second about two-thirds as long; third and fourth subequal in length, about two-thirds as long as second; fifth very small. The second joint bears one large and two small setae on its upper margin; third with two setae on the upper, and one on the lower margin at the proximal end, and one on the upper and two much longer ones on the lower margin at the distal end; the longer of the two latter setae bears plumules in the middle; at its outer extremity the fourth joint bears two small setae on the upper and a large one on the lower margin; fifth joint with five large setae about equal in length, and one small seta.

The basal joint of the antenna is pyriform in outline, somewhat longer than broad; swimming branch of the antenna nine-jointed, the first is long and slender; the second to eighth joints each bearing a seta, the ninth bearing five setae; setae of second to sixth joints naked, the others are plumose, with the exception of the last one on the ninth joint, which is minute and naked.

The mandible has a bifid masticating process. The mandibular palp consists of two joints and a chela; at its proximal end the first joint bears two serrated masticating spines and two setae on the lower margin; near its middle this joint also bears two short and a long seta on the lower and two large setae on the upper margin; second joint large and strong, its outer margin boldly arched and bearing three setae near the middle; outer margin with one seta at the distal end. The distal end of the second joint bears a strong chela; the outer branch of the chela is shorter than the inner, falcate, smooth-edged, with two long and two short spine-like processes at its inner end; the basal portion of the inner branch is straight, bent abruptly just beyond the middle, forming a hook-shaped apex which closes over the outer branch; its inner margin is flattened out to a knife-like, serrated edge; this edge bears a small tooth-like process at its proximal end; at the base of the inner branch, the second joint bears a small button-like nodule which possesses a minute spine.

The vermiform limb is armed with five spines at the end and four on the side.

The caudal laminae are short; each bears six ungues, the two uppermost of which are small and spine-like and are surrounded by cilia-like processes longer than themselves; the last four ungues are strong, gradually increase in length, and are ciliated on the edge; the last one bears a few teeth on its proximal half.

Length 1.2; greatest height 0.9 mm.

The male is unknown. Only one female was found.

Catch 612, Glorietta Bight, San Diego Bay, June 30, 1903.

NOTE ON THE HALOCYPRIDAE.

The paper on the Halocypridae of the San Diego Region was printed on April 9, 1906, but its general distribution was delayed till May 3. The paper of Professor Dr. G. W. Müller on the "Valdivia" Ostracoda was issued on April 25, 1906, and must, therefore, be given priority. This delay in distribution makes the following changes in the synonymy of my paper necessary.

Conchoecia giesbrechti G. W. Müller.

1891. *Conchoecia oblonga* G. W. Müller, p. 272, pl. XXVIII, figs. 26, 31, 32, 36, 37 (nom. praeoccup.).
1906*a*. *Conchoecia giesbrechti* G. W. Müller, p. 75, pl. XV, figs. 1-16.
1906. *Conchoecia pacifica* Juday, p. 21, pl. IV, figs. 5-7; pl. V, figs. 1, 2.

Conchoecia striola G. W. Müller.

1891. *Conchoecia striata* G. W. Müller, p. 270, pl. XXVIII, figs. 12-18 (nom. praeoccup.).
1906*a*. *Conchoecia striola* G. W. Müller, p. 91, pl. XVIII, figs. 11, 20-24.
1906. *Conchoecia mülleri* Juday, p. 24, pl. V, figs. 5-7; pl. VI, figs. 1-5.

Conchoecia ametra G. W. Müller.

1906*a*. *Conchoecia ametra* G. W. Müller, p. 117, pl. XXVII, figs. 11, 12, 14, 17-19.
1906. *Conchoecia ritteri* Juday, p. 25, pl. VI, figs. 6-8; pl. VII, figs. 1, 2.

LITERATURE.

Baird, W.

1850. The Natural History of the British Entomostraca. 364 pp., 36 pl. London, 1850. (Ray Society.)

Brady, G. S.

1880. Report on Ostracoda Dredged by H. M. S. Challenger. Zoology I, Pt. 3, 184 pp., 44 pl.

1890. Ostracoda Collected by H. B. Brady in the South Sea Islands. Trans. Roy. Soc. Edinburgh, XXXV, pp. 489-525, pl. I-IV.

1897. Supplementary Report on the Crustaceans of the Group Myodocopa obtained during the Challenger Expedition. Trans. Zool. Soc. London, XIV, pp. 85-100, pl. 15-17.

1898. On new or Imperfectly Known Species of Ostracoda, chiefly from New Zealand. Ibid., XIV, pp. 429-452, pl. 43-47.

1902. On new or Imperfectly Known Ostracoda, chiefly from a Collection in the Zoological Museum, Copenhagen. Ibid., XVI, pp. 179-202, pl. 21-25.

Brady, G. S. and Norman, A. M.

1889. A Monograph of the Marine and Fresh-water Ostracoda of the North Atlantic and North-western Europe. Pt. I, Sci. Trans. Royal Dublin Soc., IV, Ser. 2, pp. 63-270, pl. 8-23.

1896. Pt. II, Ibid., V, Ser. 2, pp. 621-746, pl. 50-68.

Dana, J. D.

1852. United States Exploring Expedition during 1837-42, XIII.

Juday, C.

1906. Ostracoda of the San Diego Region. I, Halocypridae. Univ. of Calif. Publications, Zool., III, pp. 13-38, pl. 3-7.

Müller, G. W.

1891. Neue Cypridiniden. Zool. Jahrb. Abth. f. Systematik, V, pp. 211-252, pl. 25-27.

1894. Die Ostracoden Des Golfes von Neapel. Fauna und Flora des Golfes von Neapel, XXI.

1895. Die Ostracoden. Bull. Mus. Comp. Zool., XXVII, pp. 153-169, 3 pl.

1901. Ostracoden. Nordisches Plankton, Art. VII, 10 pp.

1906*a*. Ostracoda. Abd. aus Wissenschaft. Ergeb. der deutschen Tiefsee-Expedition, 1898-99, VIII, pp. 29-154, pl. 5-35.

1906*b*. Die Ostracoden der Siboga-Expedition. Monog. XXX, Uitkomsten op Zoologisch, Bot., Oceanogr., en Geolo. Gebied verzameld in Nederlandisch Oost-Indië, 1899-1900, 40 pp., 9 pl.

1906*c*. Ostracoden. Resultats du Voyage du S. Y. Belgica, Zoologie, 7 pp., 1 pl.

Sars, G. O.

1887. Ostracoda Mediterranea. Archiv for Mathematik og Naturvidenskab. Christiana, XII, 152 pp., 20 pl.

EXPLANATION OF PLATES

PLATE XVIII.

Figs. 1, 2. *Xestoleberis dispar.*

1. Shell of female. × 105.
2. Shell of male. × 105.

Figs. 3-12. *Paracytheroma pedrensis.*

3. Shell of male. × 105.
4. Portion of anterior edge of shell. × 255.
5. Antennule. × 255.
6. Mandible. × 135.
7. Maxilla of male. × 52.
8. Leg of first pair. × 200.
9. Leg of second pair. × 200.
10. First joint of leg of third pair. × 200.
11. Postabdomen of female. × 150.
12. Postabdomen and penis of male. × 160.

Figs. 13-15. *Philomedes longiseta,* male.

13. Shell. × 37.
14. Secondary branch of antenna. × 120.
15. Furca. × 60.

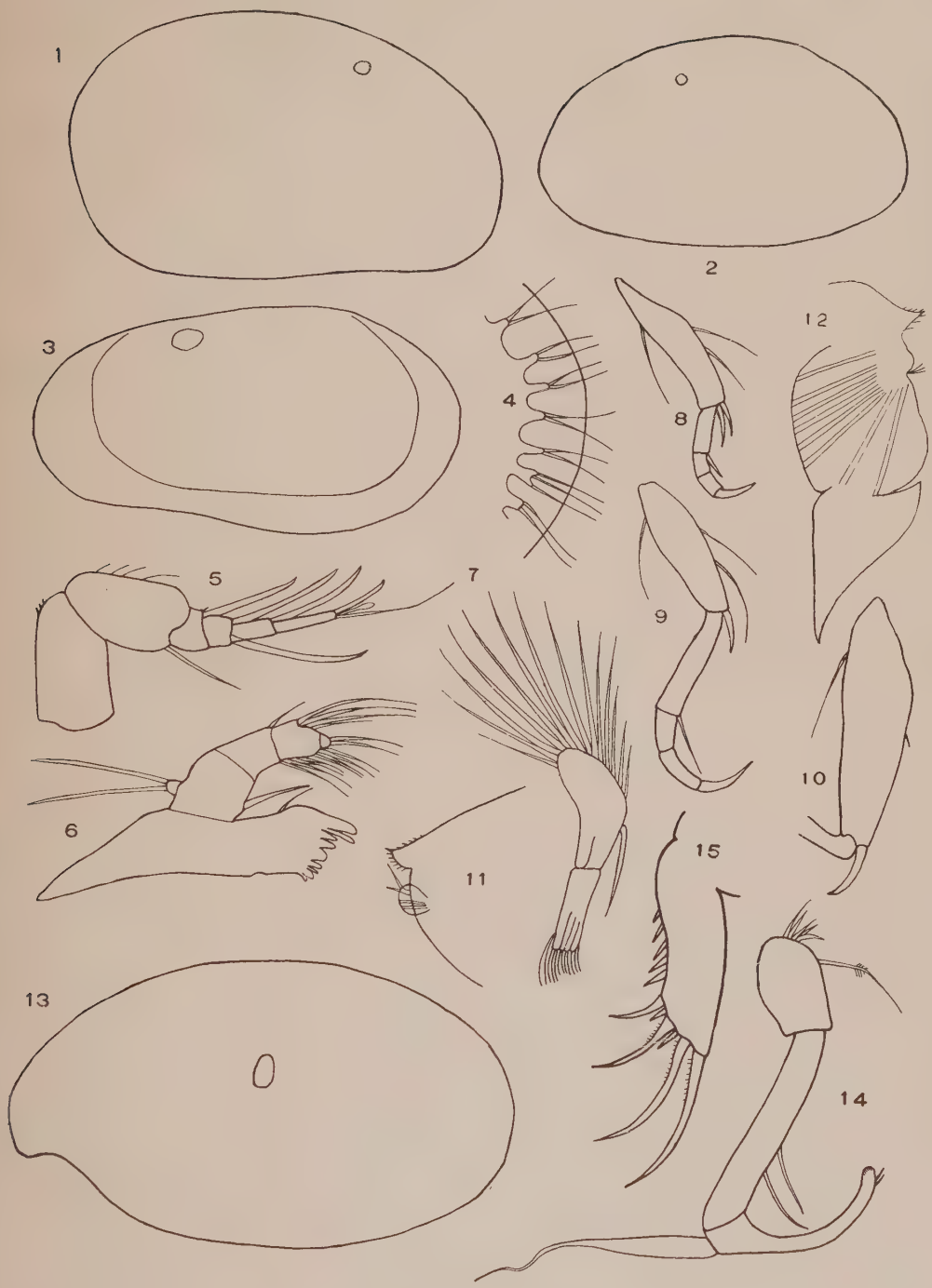

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

PLATE XIX.

Figs. 1-6. *Philomedes lomae*, male.

1. Shell of adult. × 52.
2. Frontal organ. × 190.
3. Shell of young. × 52.
4. Mandible. × 105.
5. Portion of mandibular palp, showing sensory appendage. × 270.
6. Furca. × 105.

Figs. 7-11. *Cylindroleberis mariae.*

7. Shell of female. × 52.
8. Shell of male. × 52.
9. Frontal organ of male. × 275.
10. Secondary branch of female antenna. × 275.
11. Secondary branch of male antenna. × 193.

Fig. 12. *Pleoschisma oblonga*, shell of male. × 57.

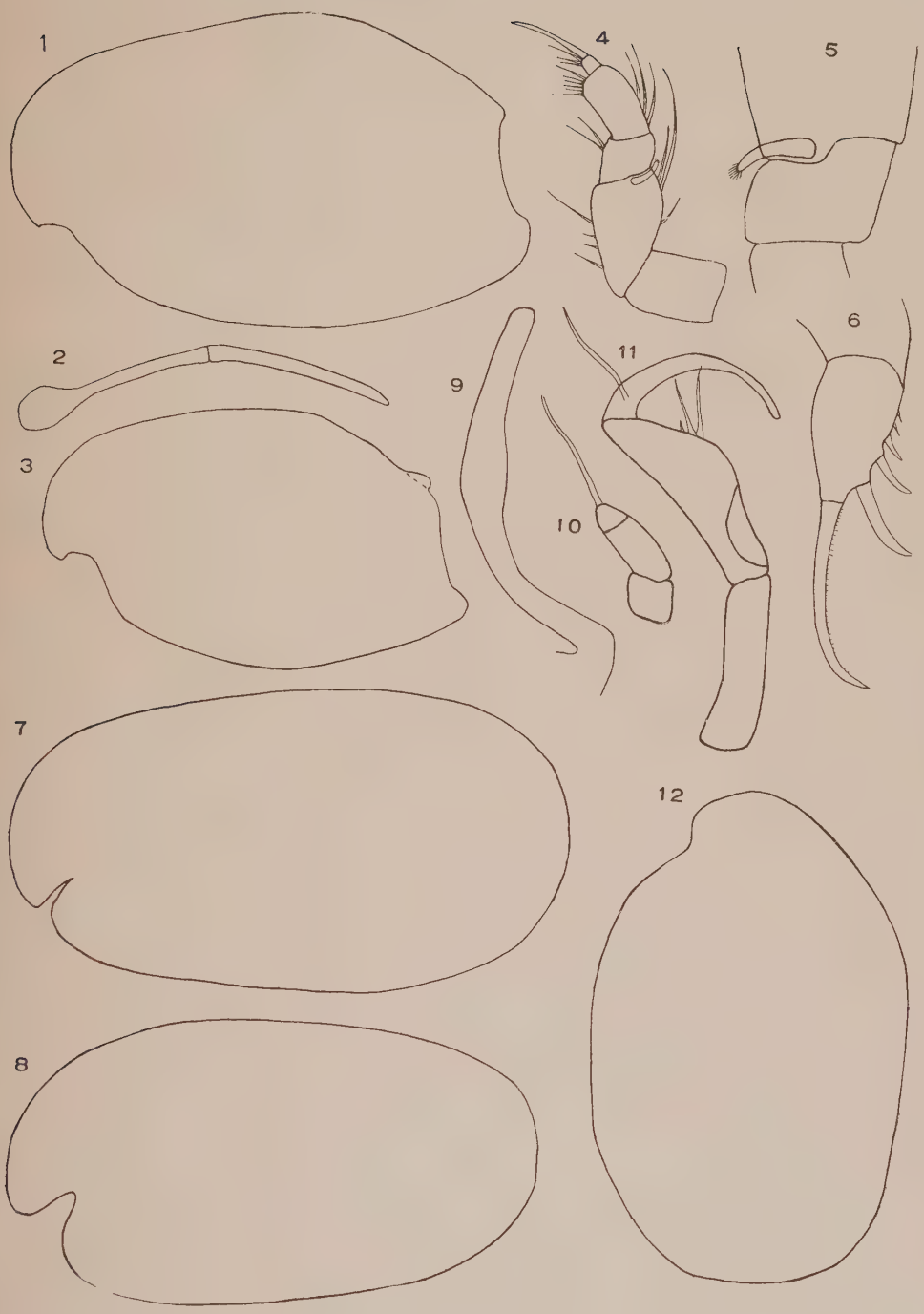

1
2
3
4
5
6
7
8
9
10
11
12

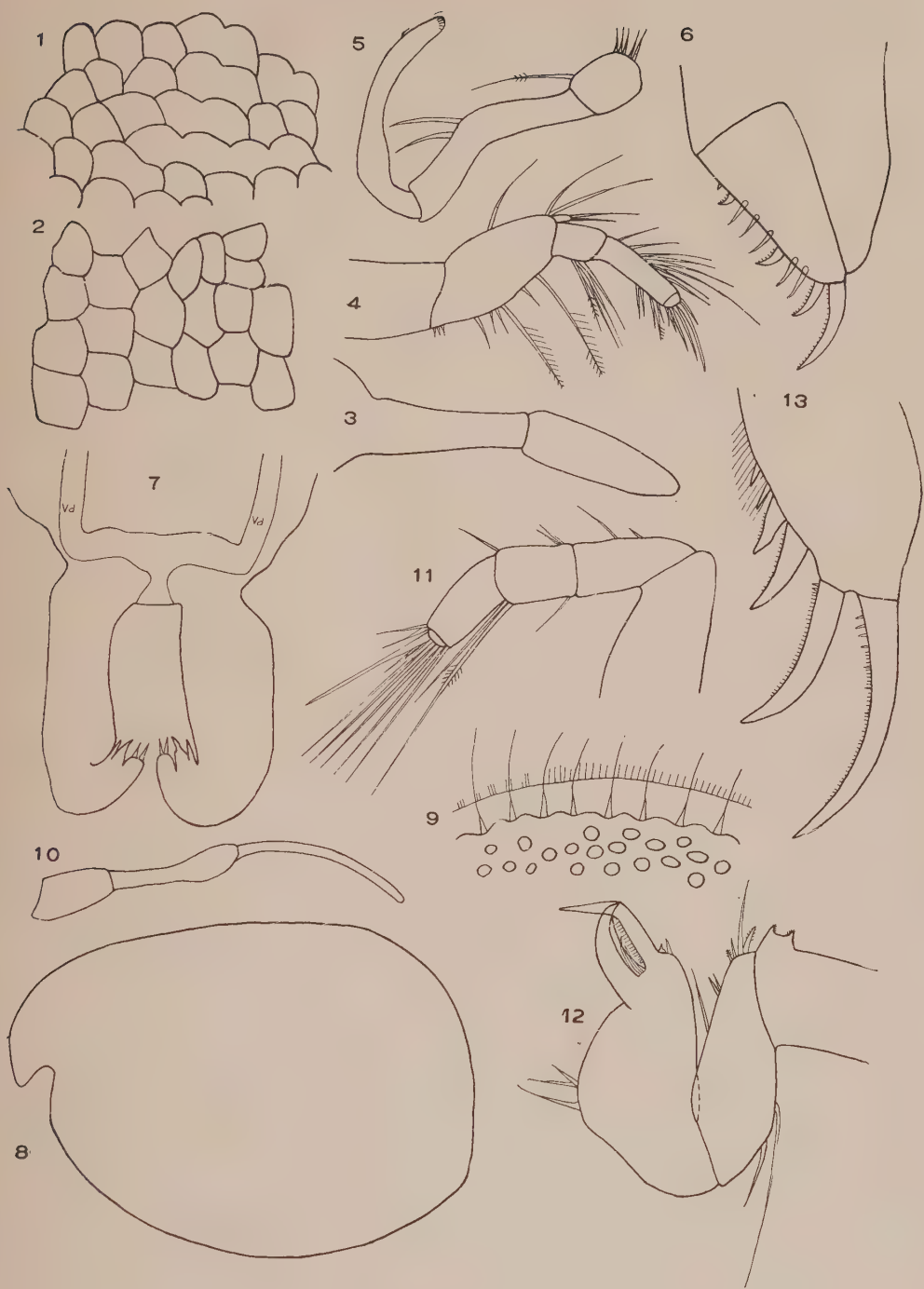
PLATE XX.

Figs. 1-7. *Pleoschisma oblonga,* male.

1. Shell markings anteriorly. × 270.
2. Shell markings posteriorly. × 270.
3. Frontal organ. 270.
4. Mandible. 105.
5. Secondary branch of antenna. × 185.
6. Furca. 105.
7. Penis. *Vd.* Vasa deferentia. × 170.

Figs. 8-13. *Rutiderma rostrata,* female.

8. Shell in side view. × 52.
9. Edge of shell antero-dorsally, showing transparent marginal membrane. × 155.
10. Frontal organ. × 155.
11. Antennule. × 110.
12. Mandible. × 150.
13. Furca. × 150.


1
2
3
4
5
6
7
Vd
Vd
8
9
10
11
12
13

UNIVERSITY OF CALIFORNIA PUBLICATIONS
ZOOLOGY
Vol. 3, No. 10, pp. 157-158, text figure 1 January 29, 1907

CONTRIBUTIONS FROM THE LABORATORY
OF THE
MARINE BIOLOGICAL ASSOCIATION OF SAN DIEGO.

XV.

CLADOCERA OF THE SAN DIEGO REGION.

BY
CHAUNCEY JUDAY.

Only one species of Cladocera was found in the thousand plankton catches that were examined.

Evadne tergestina Claus.

1877. *Evadne tergestina* Claus. Zur Kenntniss des Baues und der Organisation der Polyphemiden. Denkschr. K. Akadem. Wissensch. Math.-Naturw. Klasse, XXXVII, pp. 137-160, pl. 1-7. Wien, 1877.

1899. *Evadne tergestina* Hansen. Die Cladoceren und Cirripedien der Plankton-Expedition. Plankton-Expedition der Humboldt-Stiftung, II, G., d., 58 pp. 4 pl.

Shell elongated, rather broadly rounded behind, hyaline. Antennae and swimming feet relatively small; setae of antennae plumose. Outer ramus of first foot with two setae; those of second and third with three; that of the fourth foot with one seta. Elevators of antennae more or less widely separated and diverging dorsally. Neck-gland present.

Length 0.68; height 1.0 mm.

This Cladoceran was found in only eleven catches, eight of which were surface.

Evadne tergestina.

Evadne tergestina is very widely distributed. It has been found in the following localities: Florida Stream, Sargasso Sea, North Equatorial Stream, Gulf of Guinea, South Atlantic, two stations in the Indian Ocean, West Coast of New Holland, near Auckland, in Jervis Bay near Sydney, Mediterranean Sea, along the coast of southern California.

AMERICAN ARCHAEOLOGY AND ETHNOLOGY.—Continued.

No. 4. Basket Designs of the Indians of Northwestern California, by A. L. Kroeber. Pages 60, Plates 7, January, 1905. Price, .75

No. 5. The Yokuts Language of South Central California, by A. L. Kroeber. Pages 213, January, 1907 . . Price, 2.25

Vol. 3. The Morphology of the Hupa Language, by Pliny Earle Goddard. Pages 344, June, 1905. . . . . Price, 3.50

Vol. 4. No. 1. The Earliest Historical Relations between Mexico and Japan, by Zelia Nuttall. Pages 47, April, 1906. . Price, .50

No. 2. Contributions to the Physical Anthropology of California, by A. Hrdlicka. Pages 16, Tables 5, Plates 10, June, 1906. . . . . Price, .75

ANTHROPOLOGICAL MEMOIRS. (Quarto).

Vol. I. Explorations in Peru, by Max Uhle (in preparation).
No. 1. The Ruins of Moche.
No. 2. Huamachuco, Chincha, Ica.
No. 3. The Inca Buildings of the Valley of Pisco.

ASTRONOMY.—W. W. Campbell, Editor. (Lick Observatory, Mt. Hamilton, Cal.)

Publications of the Lick Observatory.—Volumes I–V completed. Volume VI (in progress).

No. 1. A Short Method of Determining Orbits from Three Observations, by A. O. Leuschner.

No. 2. Elements of Asteroid 1900 GA, by A. O. Leuschner and Adelaide M. Hobe.

No. 3. Preliminary Elements of Comet 1900 III, by R. H. Curtiss and C. G. Dall.

Contributions from the Lick Observatory.—Nos. I–V.

Lick Observatory Bulletins.—Volumes I–III completed. Volume IV (in progress).

BOTANY.—W. A. Setchell, Editor. Price per volume $3.50. Volume I (pp. 418) completed. Volume II (in progress).

No. 8. The Resistance of Certain Marine Algæ to Changes in Osmotic Pressure and Temperature, by W. J. V. Osterhout.

No. 9. The Rôle of Osmotic Pressure in Marine Plants, by W. J. V. Osterhout.

No. 10. On the Importance of Physiologically Balanced Solutions for Plants, by W. J. V. Osterhout.

No. 11. The Antitoxic Action of Potassium on Magnesium, by W. J. V. Osterhout.

(In one cover. Price .25)

No. 12. Cytological Studies in Cyanophyceae, by Nathaniel Lyon Gardner. . . . . Price, 1.00

No. 13. On a small Collection of Mosses from Alaska, by J. Cardot and T. Thériot . . . . . Price, .10

EDUCATION.—Edited by the Department of Education. Price per volume $2.50.

Volume I (pp. 424). Notes on the Development of a Child, by Milicent W. Shinn . . . . . Price, 2.25

Vol. II (in progress).—No. 1. Notes on Children's Drawings, by Elmer E. Brown . . . . . Price, .50

Vol. III (in progress).—No. 1. Origin of American State Universities, by Elmer E. Brown . . . . . Price, .50

No. 2. State Aid to Secondary Schools, by David Rhys Jones . . . . . Price, .75

ENGINEERING.—Edited under the direction of the Engineering Departments. This series will contain contributions from the Colleges of Mechanics, Mining, and Civil Engineering. Volume I in progress.

No. 1. Bulletin of the Department of Civil Engineering. I.—Moment Diagrams and Typical Live Loads, by Charles Derleth, Jr., Pages 1-9, Plate 1. January, 1907. . . . . Price, .10

GEOLOGY.—Bulletin of the Department of Geology. Andrew C. Lawson, Editor. Price per volume $3.50. Volumes I (pp. 428), II (pp. 450), III (475) and IV (462), completed. Volume V (in progress).

1. Carnivora from the Tertiary Formations of the John Day Region, by John C. Merriam . . . . . Price, .60
2. Some Edentate-like Remains from the Mascall Beds of Oregon, by William J. Sinclair. } In one cover. Price .15
3. Fossil Mollusca from the John Day and Mascall Beds of Oregon, by Robert E. C. Sterns. }
4. New Cestraciont Teeth from the West American Triassic, by Edna M. Wemple. . . . . Price, .10
5. Preliminary Note on a New Marine Reptile from the Middle Triassic of Nevada, by John C. Merriam. . . . . Price, .10

PATHOLOGY.—Alonzo Englebert Taylor, Editor. Price per volume $2.00 Volume I (in progress).

No. 5. On the Autolysis of Protein, by Alonzo Englebert Taylor. } In one cover.
No. 6. On the Reversion of Tryptic Digestion, by Alonzo Englebert Taylor. }
No. 7. Studies on an Ash-Free Diet, by Alonzo Englebert Taylor.
No. 8. On Fermentation, by Alonzo Englebert Taylor (in press).

CLASSICAL PHILOLOGY.—Edward B. Clapp, William A. Merrill, Herbert C. Nutting, Editors. Price per volume $2.00. Volume I (in progress).

No. 1. Hiatus in Greek Melic Poetry, by Edward B. Clapp. Price, $0.50
No. 2. Studies in the Si-clause, by Herbert C. Nutting. . . " .60
No. 3. The Whence and Whither of the Modern Science of Language, by Benj. Ide Wheeler . . . . . " .25
No. 4. On the Influence of Lucretius on Horace, by William A. Merrill . . . . . " .25
No. 5. The Priests of Asklepios (A New Method of Dating Athenian Archons), by William Scott Ferguson . . . . . " .50

PHILOSOPHY.—Volume I, completed. Price, $2.00.

PHYSIOLOGY.—Jacques Loeb, Editor. Price per volume $2.00. Volume I (pp. 217) completed. Volume II (pp. 215) completed. Volume III (in progress).

No. 5. The Toxicity of Atmospheric Oxygen for the Eggs of the Sea-Urchin *(Strongylocentrotus Purpuratus)* After the Process of Membrane Formation, by Jacques Loeb. } In one cover.
No. 6. On the Necessity of the Presence of Free Oxygen in the Hypertonic Sea-Water for the Production of Artificial Parthenogenesis, by Jacques Loeb. }
No. 7. On the Counteraction of the Toxic Effect of Hypertonic Solutions upon the Fertilized and Unfertilized Egg of the Sea-Urchin by Lack of Oxygen, by Jacques Loeb.

John Bruce MacCallum: On the Mechanism of the Physiological Action of the Cathartics. . . . . Price, 75c.

UNIVERSITY CHRONICLE.—An official record of University life, issued quarterly, edited by a committee of the faculty. Price, $1.00 per year. Current volume No. IX.

Address all orders, or requests for information concerning the above publications to **The University Press, Berkeley, California.**

European agent for the series in American Archaeology and Ethnology, Classical Philology, Education, Philosophy, and Semitic Philology, **Otto Harrassowitz, Leipzig.** For the series in Botany, Geology, Pathology, Physiology, and also American Archaeology and Ethnology, **R. Friedlander & Sohn, Berlin.**